Steve Hiebert

FY 1999 - FY2001

Fish losses through dams and turbines occur regularly at Reclamation facilities. These losses are difficult to quantify, and solutions can be even more difficult to implement. New technology in behavioral barriers using underwater strobe lights has emerged with a wide range of possibilities in reduction of loss through turbines. Evaluation and possible application of this technology could have implications in future systems to reduce fish loss through dams. Lake trout are currently entrained and pass through the energy dissipaters and turbines at Buffalo Bill Powerhouse with near zero survival. A reduction in lake trout entrainment with the use of underwater strobe lights would have application at other Reclamation facilities and possibly have entrainment reduction effects on Bull Trout, a species within the same family that is of special concern in the Pacific Northwest.

To understand fish losses at power generation facilities, the objectives were: (1) quantification of fish through turbines, including development of sampling gear, and (2) examination and evaluation of potential use of new "underwater strobe lights" as a fish barrier technology.

Monthly netting of fish passing through Unit 1 at Shasta Dam was continued. Data from this netting contribute to the Biological Evaluation of the Temperature Control Device on Lake Shasta, California. Higher numbers of fish were netted in the spring time at Lake Shasta. An evaluation of the strobe light was performed using netting at the outlet of the Shoshone Conduit and hydroacoustic techniques. Failure of some of the lighting components made the tests inconclusive, but there were indications from hydroacoustic evaluation that fish resisted passing through the light beam near the underwater strobe lights. Additionally, the lowest entrainment rates from netted fish occurred when the underwater strobe lights were on. Underwater strobe light evaluation in FY 2000 will include longer test sequences, split beam hydroacoustic equipment for evaluation, and re-designed underwater strobe light seals.

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Wyoming Department of Game and Fish
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Hiebert, Steve, and T. LaCasse. Initial Evaluation of the use of Underwater Strobe Lights as a Fish Behavioral Barrier at Buffalo Bill Dam, Wyoming. Bureau of Reclamation Travel Report to Wyoming Area Office Manager, September 23, 1999.